REMARKS

Applicants respectfully request that the above-identified patent application be reexamined and reconsidered.

Claims 1-22 are now pending in this application. In a final Office Action dated January 22, 2004 (hereinafter the "Office Action"), Claims 1-3, 9-13, 16-18, 21, and 22 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,457,065 to Rich et al. (hereinafter "Rich"). Claims 4-8, 14-15, 19, and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Rich in view of U.S. Patent No. 6,108,664 to Nori et al. (hereinafter "Nori"). While applicants strongly believe that the previously presented claims were clearly allowable in view of the cited and applied references, in order to advance the prosecution of this application, a variety of language changes and clarifications have been made in order to make the claim language more particularly point out and distinctly claim the subject matter that applicants regard as the invention. Pursuant to 37 C.F.R. § 1.111 and for the reasons set forth below, applicants respectfully request reconsideration and allowance of this application.

Prior to discussing in detail why applicants believe that all of the claims in the application are allowable, a brief description of applicants' invention and the cited references is provided. The following discussions of the disclosed embodiments of applicants' invention and the teachings of the applied references are not provided to define the scope or interpretation of any of applicants' claims. Instead, such discussed differences are provided to help the U.S. Patent and Trademark Office (hereinafter "the Office") better appreciate important claim distinctions discussed thereafter.

Summary of the Invention

In accordance with the present invention, a system and method for transmitting data between mirrored databases stored on both client and server computers are provided. More specifically, the present invention provides a system and method for efficiently synchronizing multiple databases while maintaining parent-child relationships between related database items. The method and system allows a client computer to update a server database while minimizing the number of database items transmitted between the client and server computers. By minimizing the transmission of data, the system and method supports more efficient communication between computers.

The present invention utilizes the parent-child relationships that exists between database items to determine if certain child database items stored in the client computer should be communicated to the server computer. According to one embodiment, when the client database is synchronized with the server database, parent database items are first communicated from the

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client to the server. Next, child database items associated with parent database items are communicated if there are no communication errors in the transfer of the parent database items. The method does not communicate a child database item if its associated parent database item is not properly communicated. Once the set of database items have been communicated, the database items contained on the server computer are synchronized with the client computer. If any particular database item is not successfully uploaded from the client computer to the server computer, lower level database items, i.e., children, grandchildren, etc., of the particular database item are all bypassed in the synchronization process and not uploaded to the server computer. In addition to providing an efficient synchronization method, this embodiment allows the server and client to generate database item IDs in duplicated databases without generating conflicting ID numbers for identical database items.

Summary of Rich

Rich purportedly discloses a processing system for improving the performance of distributed object systems. When a user of a workstation accesses an object stored in a global repository, the object is replicated to the user's workstation. Thereafter, modifications to the object occur locally at the workstation. When the user requests to commit the modifications, a determination is first made as to whether committing the modifications will result in an unacceptable data conflict. If no unacceptable data conflict will occur, and after resolution of those conflicts that can be resolved, the modifications are committed to the object stored in the global repository. Rich does not disclose or suggest a method that selectively chooses database items to synchronize based on the transmission of a successor (i.e., parent, grandparent, etc.) database item.

Rich refers to the workstation as a child node and the server computer storing the global repository as a parent node. During operation, the method replicates objects from the parent node to the child node during a transaction between the two nodes. When the transaction is committed, i.e., data is written to the global repository, the method simply merges the replica of the object from the child node to the parent node. Rich does not disclose or suggest a method where the communication of a database object relies on a successful communication of another database object.

Summary of Nori

Nori purportedly discloses a system and method for presenting and modifying data from a set of tables in a database. Nori discloses general methods for defining views based on a set of tables that include relational tables or object tables. The view defines a presentation of data from

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the one or more tables as a set of objects that reside in the database. Data is read from the rows of the tables based on the view, and is presented as a set of objects that reside in the database. An object ID that is based on data from the one or more rows is generated and associated with each object presented. *Nori*: Abstract. Nori also discloses a generally known method for assigning database IDs to objects when an object is created. *Id.* Col. 8, lines 53-60.

Rejection of Claims 1-23 Under 35 U.S.C. § 102

The Office Action rejected Claims 1-3, 9-13, 16-18, 21, and 22 under 35 U.S.C. § 102(e) as being anticipated by Rich. The Office Action asserts that Rich discloses each and every element of these claims. As described in more detail below, applicants respectfully disagree.

Claim 1, as amended, recites:

> 1. A method of optimizing the synchronization of data between a client computer having a client database and a server computer having a server database, comprising:
>
> communicating a plurality of database items from the client computer to the server computer, wherein the plurality of database items includes a parent database item;
>
> determining if the parent database item is improperly received, wherein the determination of an improperly received parent database item is based upon the detection of a data transfer error associated with the parent database item;
>
> selectively communicating a child database item associated with the parent database item from the client computer to the server computer, only if no data transfer error was detected with respect to the parent database item; and
>
> synchronizing the communicated child database item with a corresponding child database item stored on the server computer.

As amended, Claim 1 defines a method where the communication and synchronization of a child database item depends on the result of the communication of the parent database item. More specifically, the claimed method involves (1) communicating a plurality of database items wherein the plurality of database items includes a parent database item, (2) selectively communicating a child database item associated with the parent database item from the client computer to the server computer, only if no data transfer error was detected with respect to the parent database item, and (3) synchronizing the communicated child database item with a corresponding child database item stored on the server computer. The method of Claim 1 discloses a process that reduces the amount of data communicated between the client and server when maintaining duplicate databases.

Conversely, Rich purportedly discloses a processing system for improving the performance of distributed object systems. A purpose of distributed object systems is to make

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"objects" available for execution on applications distributed over remote computer systems. As described in Rich, a distributed object system "is an execution environment in which objects may be located on more than one physical computer and the application programs which operate upon those objects may also be located on (and operating on) more than one computer . . . ." Rich at Col. 1, lines 27-30. Examples of distributed object systems include Enterprise JavaBeans ("EJB's) and the Common Object Request Broker Architecture ("COBRA"). *Id.* at Col 1, lines 40-45. As known to those skilled in the art, objects created by distributed object systems are common among object-oriented programming languages. A common definition of an object in an object-oriented environment like distributed object systems is a software bundle of related variables and methods used to model real-world objects found in everyday life. In Rich, objects implemented in software are used to model the real-world object referred to as a "transaction." *Id.* at Col. 4, lines 25-30.

Similar to Rich, the present invention replicates data between computers. However, objects replicated in Rich are fundamentally different from the parent and child database items replicated by the method recited in Claim 1. Parent and child database items are collections of data that maintain a hierarchical tree relationship and reference other database items. As described in the present application, one benefit to structuring database items in a hierarchical tree is that the amount of data communicated between the client and server may be reduced. Simply stated, the method disclosed in Rich does not communicate "a plurality of ***database items*** from the client computer," as recited in Claim 1. Instead, Rich discloses replication of objects of the type used in object-oriented environments like distributed object systems.

Rich does not disclose a method of selectively replicating database items that maintain a hierarchical tree structure. Claim 1 of the present application states that replicating database items involves "selectively communicating a child database item associated with the parent database item from the client computer to the server computer, only if no data transfer error was detected with respect to the parent database item." The Office Action states that Rich discloses a system whereby objects are maintained in a hierarchical tree structure similar to database items disclosed in the present application. In support of that proposition, the Office Action sites the following sections of Rich: Abstract, Figures 4A-4B, Col. 4, lines 55-64, Col. 10, lines 11-41, and Col. 11, lines 20-67. However, the referenced sections of Rich do not disclose a system whereby objects are maintained in a hierarchical tree structure. Specifically, Rich states:

> An example configuration of a distributed object system 400 having six nodes with four transactions spanning various ones of these six nodes according to the present invention is depicted in FIG. 4A. This example configuration

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> accesses (and therefore replicates) objects stored in four separate repositories 450, 451, 452, and 453 (**which may be considered as four additional server nodes of the distributed object system**). (*Emphasis added.*)

Rich refers to a workstation as a child node and a server computer storing a global repository of objects as a parent node. When a user of the child node, e.g., a workstation, accesses an object stored in a global repository of a parent node, the method replicates the object from the parent node to the child node. Thereafter, modifications to the object occur locally at the workstation. "Child" transactions (i.e., transactions occurring on the child node) are then merged into data stored in a global repository. Simply stated, the method disclosed in Rich does not communicate "a child database item associated with the parent database item," as recited in Claim 1. Instead, Rich replicates objects that do not maintain a relationship with other objects.

A decision-making process of selectively choosing database items to communicate between client and server computers is not disclosed in Rich. Specifically, the method disclosed in Rich merely determines if an object stored on a child node should be merged with an object stored on a parent node. The two objects are conditionally merged together based on a condition that depends on the existence of an unacceptable data conflict. Applicants respectfully submit that a method of merging two objects together is quite different from the decision-making process recited in Claim 1. More specifically, Rich does not disclose a method of "selectively communicating a child object associated with the parent object from the client computer to the server computer, only if no data transfer error was detected with respect to the parent object." Since Rich does not maintain objects in a hierarchical tree structure, the decision-making process of Claim 1, where some database items are transmitted based on the successful transmission of items higher in the hierarchical tree structure (i.e., parent, grandparent, etc.), is not disclosed in Rich.

Rich does not disclose a method of synchronizing database items that are mirrored in two databases. Claim 1 of the present application states that database items are mirrored by "synchronizing the communicated child database item with a corresponding child database item stored on the server computer." The synchronization of database items is not the same as the merging of objects disclosed in Rich. As described previously, Rich merges objects of the type used in object-oriented environments like distributed object systems. Objects of the type described in Rich consist of a different set of information from child database items disclosed in the present application. As known to those skilled in the art, information sets that consist of fundamentally different types of data are not synchronized using the same techniques. Stated

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differently, Rich does not disclose synchronizing "child database item(s)" existing in mirrored databases.

To establish a proper rejection under 35 U.S.C. § 102, M.P.E.P. § 2143 states that, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." M.P.E.P. § 2131 (February 2003). The M.P.E.P. further states that, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claim." *Id.* Applicants respectfully submit that Rich fails to expressly or inherently teach, disclose, or suggest each and every element of Claim 1. For instance, as explained above, Rich fails to disclose or suggest "selectively communicating a child database item associated with the parent database item from the client computer to the server computer, only if no data transfer error was detected with respect to the parent database item." Accordingly, for at least these reasons, applicants respectfully submit that the rejection of Claim 1 is in error and request that it be withdrawn.

Claim 2 is directed to a synchronization method where the communication of a child object depends on the communication of a parent object. More specifically, as amended, Claim 2 recites:

> 2. A method of optimizing the synchronization of data between a client computer having a client database and a server computer having a server database, wherein each database comprises a plurality of database items arranged in a hierarchy comprising at least one parent database item and at least one associated child database item, comprising:
>
> receiving at the server computer a parent database item transferred from the client computer;
>
> assigning a status code to the parent database item received at the server computer, the status code being based upon the detection or non-detection of a data transfer error;
>
> transmitting the status code assigned to the parent database item to the client computer, wherein the status code is assigned to the parent database item stored in the client database;
>
> updating a status code of child database items associated with the parent database item in the client database, the updated status code of child database items being based on the status code of the parent database item;
>
> selectively communicating child database items associated with the parent database items from the client computer to the server computer, wherein child database items associated with the parent database item are communicated if the status code indicates a non-detection of a data transfer error associated with the parent database item; and

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synchronizing the communicated child database item with a corresponding child database item stored on the server computer.

As noted above, Rich does not disclose or suggest any method where the communication of one database item, such as a child database item, depends on the communication of another database item such as a parent database item. Moreover, Rich does not disclose a method that synchronizes child database items while maintaining the items' hierarchical structure. Lastly, Rich does not disclose applicants' claimed combination of steps, including the combination of (1) receiving at the server computer a parent database item transferred from the client computer, (2) selectively communicating child database items associated with the parent database items from the client computer to the server computer, wherein child database items associated with the parent database item are communicated if the status code indicates a non-detection of a data transfer error associated with the parent database item, and (3) synchronizing the communicated child database item with a corresponding child database item stored on the server computer. Since Rich fails to expressly or inherently teach, disclose, or suggest each and every element of Claim 2, applicants respectfully submit that the rejection of Claim 2 is in error and request that it be withdrawn.

Since Claims 3, 9 and 10 depend from Claim 2, and Claims 11 and 12 are computer-readable medium and apparatus claims having language that parallels the language of Claim 2, the analysis applied to Claim 2 also applies to these claims and their respective dependent claims. Therefore, applicants respectfully submit that Claims 3 and 9-12 are in condition for allowance for the same reasons as Claim 2. In addition, applicants submit that the dependent claims are allowable for additional reasons.

Claim 4 defines a claimed combination of steps, including the combination of "assigning a server ID to the database item received at the server computer if no transfer error was detected; and transmitting the server ID assigned to the database item to the client computer." Applicants submit that the Office Action has failed to show, and applicants are unable to find, where Rich discloses a method where an ID is assigned "if no transfer error was detected." The Office Action states that "Rich does suggest the server assigns a status code such as a version status of the objects." However, there is no suggestion of a method where server IDs are assigned if no transfer error is detected. Stated differently, Rich does not disclose the process of when to assign IDs to database items that are being synchronized between remote computers.

Claim 13 recites a synchronization method where the communication of a child database item depends on the communication of a parent database item. In this method, a parent database

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item is transmitted from a client computer to a server computer. The method also includes "selectively communicating child database items associated with the parent database item from the client computer to the server computer, wherein child database items associated with the parent database items are communicated if the status code indicates a non-detection of a data transfer error associated with the parent database item."

As noted above, Rich does not disclose or suggest any method where the communication of one database item, such as a child database item, depends on the communication of another database item, such as a parent database item. Also, objects replicated in Rich are fundamentally different from the parent and child "database items" recited in the present claims. Therefore, Rich fails to disclose a method of "selectively communicating child database items associated with the parent database items from the client computer to the server computer, wherein child database items associated with the parent database item are communicated if the status code indicates a non-detection of a data transfer error associated with the parent database item." Among other features unique to applicants' invention, Rich does not disclose applicants' claimed combination of steps utilizing mapping information. Mapping information is simply absent from this cited reference. Thus, for at least these reasons, applicants respectfully submit that the rejection of Claim 13, and dependent Claims 17 and 18, is in error and request that it be withdrawn.

Claim 18 is directed to a synchronization method where the communication of a child database item depends on the communication of a parent database item. In this method, a parent database item is received at a server computer. The method also includes "assigning a status code to the parent database item, the status code being based upon the detection or non-detection of a data transfer error associated with the parent database item" and "transmitting the status code assigned to the parent database item from the server computer to the client computer, wherein the status code enables the client computer to selectively communicate at least one child database item associated with the parent database item if the status code assigned to the parent database item indicates the absence of a data transfer error; and receiving at the server computer at least one child database item associated with the parent database item, if the status code assigned to the parent database item indicates the absence of a data transfer error."

As noted above, Rich does not disclose or suggest any method where the communication of one database item, such as a child database item, depends on the communication of another database item, such as a parent database item. Accordingly, applicants submit that Rich does not disclose a method that includes "receiving at the server computer at least one child database item associated with the parent database item, if the status code assigned to the parent object indicates

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the absence of a data transfer error." Thus, for at least these reasons, applicants submit that Claim 18, and its respective computer-readable medium and apparatus claims, Claims 21 and 22, are in condition for allowance.

Rejection of Claims 1-23 Under 35 U.S.C. § 103(a)

The Office Action rejected Claims 4-8, 14-15, 19 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Rich in view of Nori. The Office Action asserts that Rich and Nori suggest each and every element of these claims and that it would be obvious to combine the teachings of Rich and Nori. Applicants respectfully disagree.

As noted in detail above, the independent claims from which Claims 4-8, 14-15, 19, and 20, respectively, depend (Claims 2, 13 and 18) are all directed to methods where the communication of one database item, such as a child database item, depends on the communication of another database item, such as a parent database item. Moreover, objects replicated in Rich are fundamentally different from the parent and child "database items" replicated in the present invention. As described below, applicants respectfully submit that Rich, alone or in combination with Nori, fail to disclose or suggest this and other claimed features.

Nori purportedly discloses a system and method for presenting and modifying data from a set of tables in a database. Nori discloses a general method for defining views based on a set of tables that include relational tables or object tables. Nori also discloses a generally known method for assigning database IDs to objects when an object is created. *Id.* at Col. 8, lines 53-60. There is no suggestion of a method that synchronizes database items mirrored in multiple databases . In addition, Nori does not make any reference or suggest combining its disclosed methods with a synchronization method.

With respect to Claims 4-8, referring to Claim 2, applicants submit that Rich, alone or in combination with Nori, fails to disclose or suggest the claimed combination of steps, including the combination of (1) receiving at the server computer a parent database item transferred from the client computer, (2) selectively communicating child database items associated with the parent database items from the client computer to the server computer, wherein child database items associated with the parent database item are communicated if the status code indicates a non-detection of a data transfer error associated with the parent database item, and (3) synchronizing the communicated child database item with a corresponding child database item stored on the server computer.

Although Nori refers to database IDs assigned by the server, the combination of Nori and Rich does not suggest a method including "selectively communicating child database items associated with the parent database items from the client computer to the server computer,

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wherein child database items associated with the parent database item are communicated if the status code indicates a non-detection of a data transfer error associated with the parent database item, and" and "synchronizing the communicated child database item with a corresponding child database item stored on the server computer." Moreover, Rich does not make any reference or suggest combining its disclosed methods with an object identification system as disclosed in Nori.

In addition, specific to Claim 4, Rich and Nori fail to disclose or suggest other claim elements. Although Nori discloses a method of assigning an ID to a newly created database object, Nori does not suggest or contemplate a method of "assigning a server ID to the database item received at the server computer if no transfer error was detected; and transmitting the server ID assigned to the database item to the client computer." In view of the foregoing, and by virtue of their dependency on Claim 2, applicants submit that Claims 4-8 are in condition for allowance.

With respect to Claims 14 and 15, applicants respectfully submit that Rich, alone or in combination with Nori, fails to disclose or suggest the claimed combination, including the Claim 13 recitation of "selectively transmitting child database items from the client computer to the server computer, wherein child database items associated with the parent database item are communicated if the mapping information indicates a non-detection of a data transfer error associated with the parent database item." In addition, Rich and Nori are silent with respect to the use of mapping information to indicate a non-detection of a data transfer error of the parent database item. Since Rich, alone or in combination with Nori, fail to disclose these features, applicants submit that Claims 14 and 15 are in condition for allowance.

With respect to Claims 19 and 20, applicants respectfully submit that Rich, alone or in combination with Nori, fails to disclose or suggest the claimed combination, including the independent Claim 18, recitations of "assigning a status code to the parent database item, the status code being based upon the detection or non-detection of a data transfer error associated with the parent database item" and "transmitting the status code assigned to the parent database item from the server computer to the client computer, wherein the status code enables the client computer to selectively communicate at least one child database item associated with the parent database item if the status code assigned to the parent database item indicates the absence of a data transfer error; and receiving at the server computer at least one child database item associated with the parent database item, if the status code assigned to the parent database item indicates the absence of a data transfer error."

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Even when combined with Nori, Rich does not disclose or suggest any method where the communication of one database item, such as a child database item, depends on the communication of another database item, such as a parent database item. Hence, it is clear that Rich and Nori fail to suggest each claim element of Claims 19 and 20. To establish a prima facie case of obviousness, M.P.E.P. § 2143 requires that the prior art references "must teach or suggest all of the claim limitations," and that there "must be some suggestion or motivation, either in the references themselves or in knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings." M.P.E.P. § 2143 (February 2003). As described above, the Office has failed to show, and applicants are unable to find, where Rich and Nori, alone or in combination, disclose or suggest each and every element of Claims 4-8, 14-15, 19 and 20. Thus, for at least these reasons, applicants respectfully submit that the Office has not established a *prima facie* case of obviousness and respectfully submit that these claims are in condition for allowance.

CONCLUSION

In view of the foregoing remarks, it is submitted that the present application is now in condition for allowance. Reconsideration and reexamination of the application, and allowance of the claims are solicited. If the Examiner has any questions or comments concerning this matter, the Examiner is invited to contact applicants' undersigned attorney at the number below.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid and addressed to MAIL STOP NON-FEE AMENDMENT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the below date.

Date: April 12, 2004

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